

WORLD METEOROLOGICAL ORGANIZATION

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CBS LEAD CENTRES FOR GCOS

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REPORT OF THE REGION IV LEAD CENTRE FOR GCOS

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SUMMARY AND PURPOSE OF DOCUMENT

The document provides a summary of activities of the Region IV Lead Centre-
NOAA/NCEI.

DISCUSSION

Background

The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) serves as the GCOS Lead Center for Region IV and also as the Global Archive and Analysis Center. Region IV stretches from the Canadian Arctic to the equator. It includes three large countries; USA, Canada, and Mexico which contain more than 75% of the surface-based observing stations as well as many smaller countries and island nations that provide critical coverage for weather and climate observations throughout the region. The large number of small nations makes the continuing effort of coordination and support an essential part of ensuring the health of the region's observing network.

This report contains a summary of the state of the surface-based global observing system for GSN and GUAN networks with a specific focus on those provided by Region IV members.

In addition to the information provided in this report, NCEI provides monthly updates of web accessible GSN and GUAN reports for all WMO Regions. These provide information on the number of hourly, synoptic, and CLIMAT reports received at NOAA/NCEI. The reports are available at <https://www.ncei.noaa.gov/pub/data/gcos/>. Representatives from other Lead Centers are invited to review these reports and provide feedback on their usefulness. There are reports, such as GSN_sum_long_term.txt, that provides the number of hourly and synoptic reports received and if CLIMAT data were received each month from 2001 to present. A similar report is provided for RBCN stations (RBCN_sum_long_term.txt). These reports are also provided in comma separated (csv) format, and they are provided by Region as well (e.g., WW_REG1_POR_summary.csv). Statistics of the performance of GUAN stations are also provided.

Performance of the RBCN and GSN networks in Region IV

The performance of a Region IV RBCN inventory consisting of 337 stations is summarized for 2022. As with the RBSN surface network, Canada and the U.S. have the greatest number of stations providing CLIMAT reports. A subset of 177 GSN stations also is summarized in this report.

The percentage of RBCN stations in the current inventory of stations providing at least nine CLIMAT reports each year from 2001-2022 has exceeded 80% since 2014 (Figure 1; computed as a percentage of the current inventory). The GSN network has remained above 85% since 2010. The very high percentage of GSN stations providing at least

nine months of CLIMAT data in 2019 is particularly noteworthy, followed by small improvements in successive years through 2022.

Figure 2 shows the reporting frequency of each GSN station in 2022. The same is shown for RBCN stations in Figure 3. As typically happens each year, system outages resulted in several stations providing less than complete annual coverage. This again occurred most notably in remote areas for which unscheduled maintenance cannot be readily performed (Table 1). The greater than 90% coverage of stations with good reporting practices in the GSN network since 2015 indicates the benefit that careful monitoring and attention to the performance of a subset of stations can provide to improving data collection.

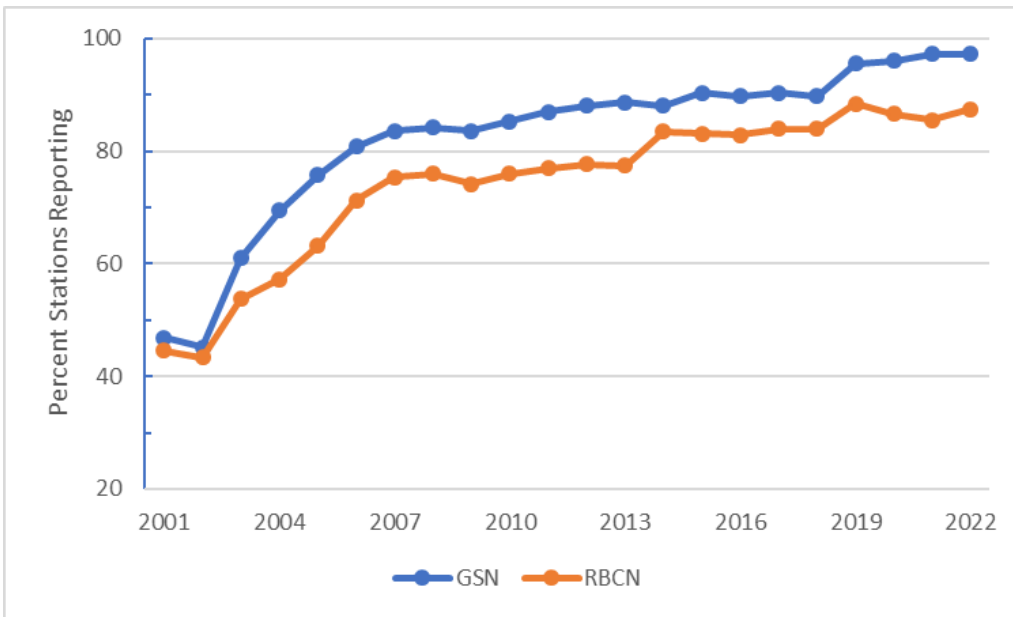


Figure 1. Percentage of Region IV RBCN stations providing CLIMAT reports (orange) and the subset of GSN stations (blue) providing CLIMAT reports in at least nine months each year from 2001 through 2022 (as a percentage of the 2022 inventory).

GSN, No. months reporting (202201 to 202212), RED=12, BLUE=6 to 11, GREEN=1 to 5, GRAY=0

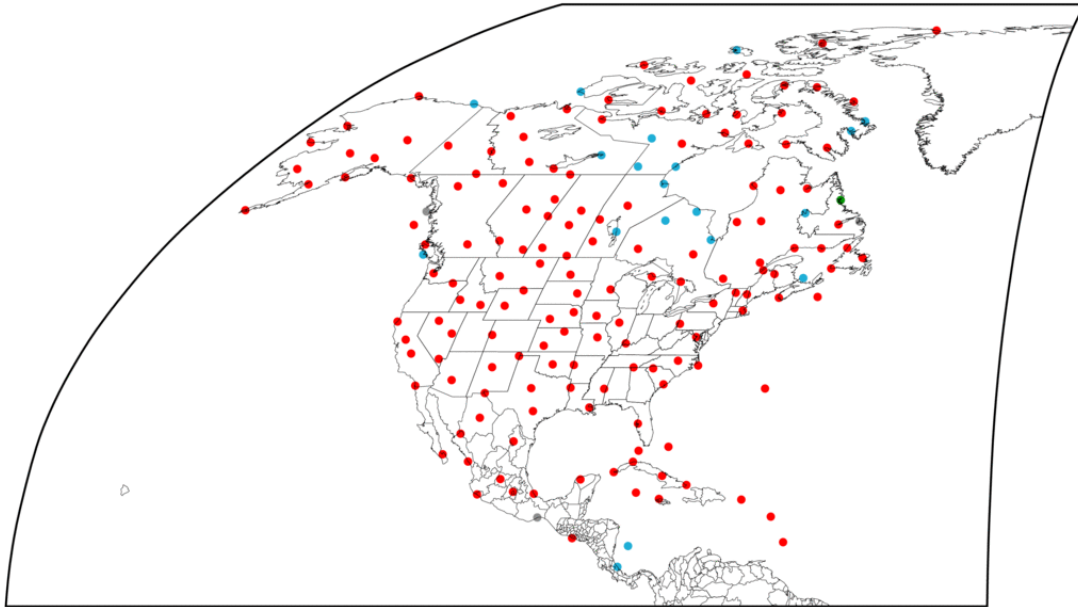


Figure 2. The reporting frequency of the Region IV stations in the GSN network in 2022; stations reporting all 12 months of the year (red), from 6 to 11 reports (blue), 1 to 5 reports (green), and 0 reports (grey).

RBCN, No. months reporting (202201 to 202212), RED=12, BLUE=6 to 11, GREEN=1 to 5, GRAY=0

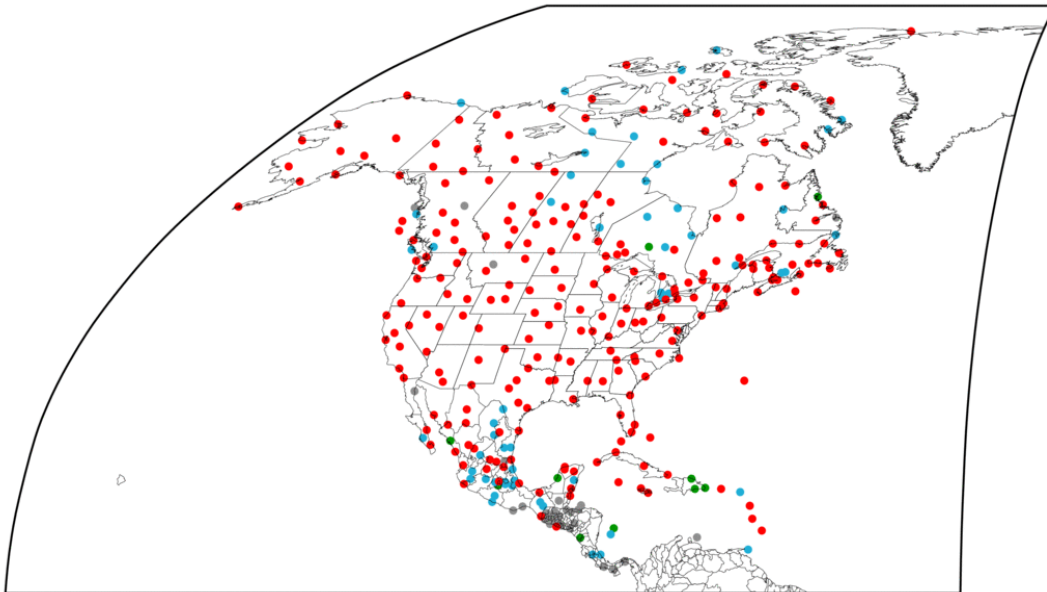


Figure 3. The reporting frequency of the Region IV stations in the RBCN network in 2022; stations reporting all 12 months of the year (red), from 6 to 11 reports (blue), 1 to 5 reports (green), and 0 reports (gray).

The following provides a summary of Region IV GSN stations with reporting problems in 2022. There are many other stations that require ongoing personal contact to ensure receipt of data throughout all areas of the Region. The Region IV Lead Center made direct e-mail contact to resolve reporting issues for more than 100 CLIMAT reports for GSN stations in 2022.

Table 1. Region IV GSN stations with reporting issues in 2022.

Data-Months	WMO #	Station Name	Country	Findings
8/2022-9/2022	70086	BARTER ISLAND, ALASKA	Canada	Not enough data to generate a CLIMAT message.
8/2019-Present	70398	ANNETTE ISLAND	United States	Not enough data to generate a CLIMAT message.
9/2022-10/2022	71074	ISACHSEN (AUT)	Canada	Equipment Issue.
6/2022-8/2022	71158	BERENS RIVER	Canada	Communications Issue.
3/2022-6/2022	71160	FORT RELIANCE	Canada	Not enough data to generate a CLIMAT message.
8/2022	71208	BIG TROUT LA	Canada	Not enough data to generate a CLIMAT message.
11/2022	71309	MOOSONEE RCS	Canada	Not enough data to generate a CLIMAT message.
4/2022-6/2022	71322	ARVIATE CLIMATE	Costa Rica	Equipment Issue.
9/2022-10/2022	71350	HARRINGTON CDA CS	Canada	Equipment Issue.
10/2022	71357	QIKIQTARJUAQ	Canada	Communications Issue.
8/2022	71357	QIKIQTARJUAQ	Canada	Not enough data to generate a CLIMAT message.
8/2022	71434	PEAWANUCK (A	Canada	Not enough data to generate a CLIMAT message.
6/2022-7/2022	71467	SACHS HARIBOU	Canada	Communications Issue.
11/2021-1/2022	71490	ROBERTSON LA	Canada	Not enough data to generate a CLIMAT message.
8/2022-Present	71665	NAIN	Canada	Communications Issue.
1/2022-6/2022	71665	NAIN NEWFOUNDLAND	Canada	Equipment Issue.
8/2022	71696	CHURCHILL CL	Canada	Not enough data to generate a CLIMAT message.
12/2019-Present	71818	CARTWRIGHT	Canada	Equipment Issue.
3/2022	71826	PANGNIRTUNG	Canada	Equipment Issue.
8/2022	71894	ESTEVAN POINT CS	Canada	Communications Issue.
12/2022	71923	ENNADAI LAKE	Canada	Not enough data to generate a CLIMAT message.
1/2022	72386	LAS VEGAS/MC	United States	Communications Issue.
1/2022	72594	EUREKA	United	Communications Issue.

			States	
6/2022	73075	SCHEFFERVILLE	Canada	Communications Issue.
2/2022-3/2022	73075	SCHEFFERVILLE	Canada	Not enough data to generate a CLIMAT message.
11/2022	76225	CHIHUAHUA	Mexico	Communications Issue.
5/2022-6/2022	76311	CHOIX, SIN	Mexico	Communications Issue.
12/2022	76577	GUANAJUATO	Mexico	No reply received to date from GCOS Focal Point.
8/2022	76692	VERA CRUZ	Mexico	No reply received to date from GCOS Focal Point.
9/2021-Present	76833	SALINA CRUZ	Mexico	Equipment Issue.
8/2019-Present	78016	BERMUDA NAS	Bermuda	No reply received to date from GCOS Focal Point.
11/2022	78384	OWEN ROBERTS	Cayman Islands	Communications Issue.
9/2022	78388	MONTEGO BAY/	Jamaica	Communications Issue.
12/2022-Present	78767	PUERTO LIMON	Costa Rica	Communications Issue.
11/2022	78767	PUERTO LIMON	Costa Rica	Communications Issue.
10/2022	78767	PUERTO LIMON	Costa Rica	Communications Issue.
9/2022	78767	PUERTO LIMON	Costa Rica	Communications Issue.
2/2022	80001	SAN ANDRES S	Colombia	No reply received to date from GCOS Focal Point.

Upper Air Observations

In Region IV, 23 of 24 GUAN stations were operating in 2022. There continued to be a high level of data collected in the region, although performance compared to 2020 was slightly diminished in a few locations (Figure 4a and 4b). The most consistent reporting took place in the U.S. and Canada, with most stations having at least 30 soundings each month reaching 30hPa and 10hPa.

With the exception of Juan Santamaria, Costa Rica, where no observations were collected in 2022, only a few stations had maintenance or other issues that presented challenges to maintaining fully functional systems (Table 2). In comparison to other regions, the issues in Region IV were relatively minor, which reflected in the overall good performance of the network in 2022.

Note: The reporting issues in Table 2 were compiled by NCEI as part of its contribution to the WMO as the GCOS Archive Center.

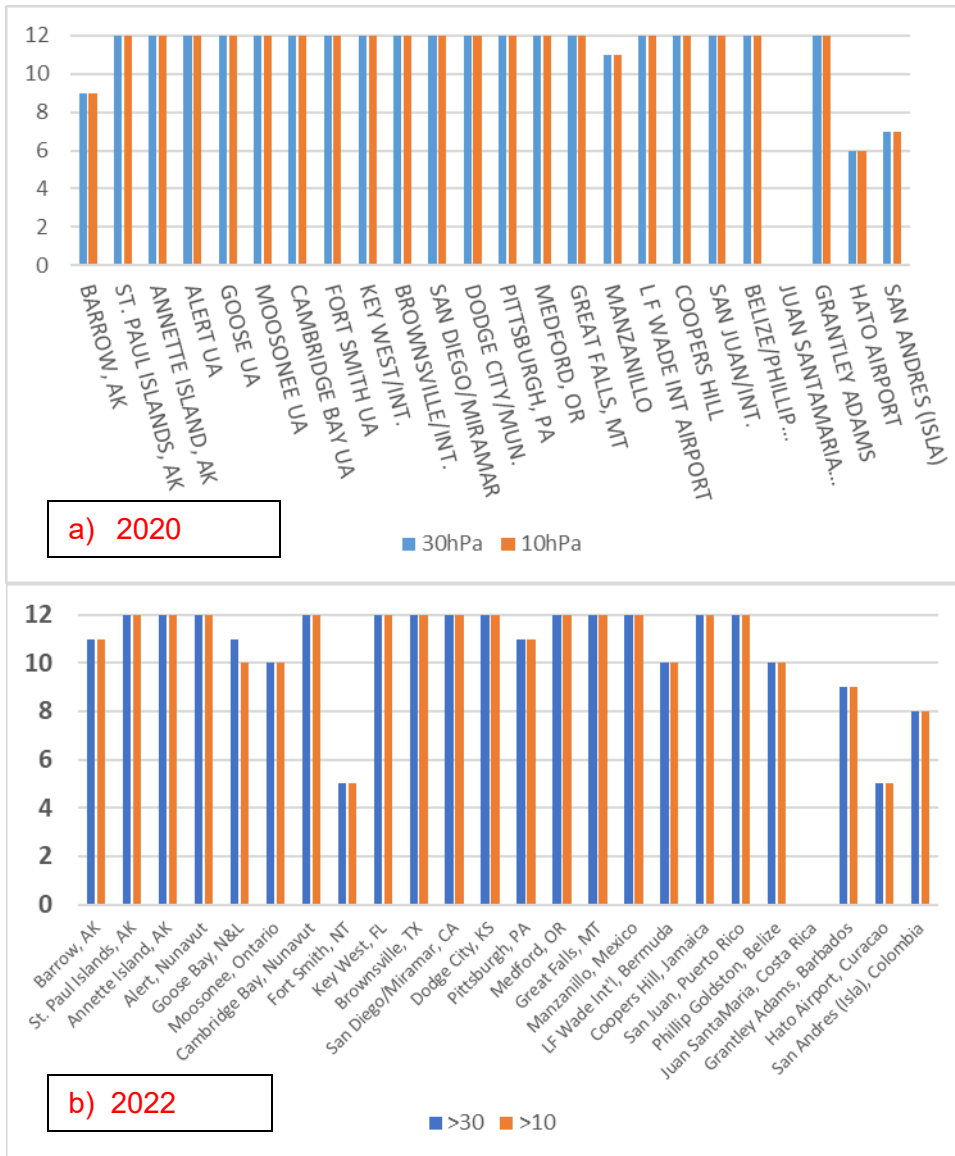


Figure 4. The number of months in 2020 (a) and 2022 (b) in which at least 30 soundings reached 30 hPa (blue) and 10 hPa (red) for each Region IV GUAN site.

Table 2. NCEI's record of documented reporting issues with GUAN stations in all WMO Regions in 2022.

Data-Months	Region	WMO #	Station Name	Country	NCEP (1st)	Findings
12/1/2022-Present	6	08508	LAJES (ACORES)	Portugal		No reply received to date from GCOS Focal Point.
7/2021-Present	5	11035	WIEN/HOHE WARTE, AT	Austria	Yes	No reply received to date from GCOS Focal Point.

11/2021-Present	6	17607	ATHALASSA	Cyprus		NCEI working to get BUFR Messages integrated into IGRA.
8/2022-Present	2	30230	KIRENSK	Russia		Current conflicts between Russia and Ukraine have created possible communications embargo between U.S. and Russia.
5/2022-Present	6	33345	KIEV	Ukraine		Very likely out of service due to Ukraine/Russia Conflict.
3/2022	6	33345	KIEV	Ukraine		Very likely out of service due to Ukraine/Russia Conflict.
5/2022-Present	6	37789	YEREVAN	Armenia		Equipment Issues.
1/2022	6	40265	MAFRAQ	Jordan		No reply received to date from GCOS Focal Point.
2/2014-Present	2	41780	KIRACHI	Pakistan	Yes	PILOT Observations during portions of this time
8/2021-2/2022	2	43003	BOMBAY / SANTACRUZ	India	Yes	No reply received to date from GCOS Focal Point.
1/2022-Present	2	43599	GAN	Maldives		Equipment Issues.
7/2021-Present	2	48327	CHIANG MAI	Thailand	Yes	PILOT Observations
2/2022-8/2022	2	48453	BANGNA	THAILAND		PILOT Observations
12/1/2022-Present	2	50527	HAILAR	China		No reply received to date from GCOS Focal Point.
10/2021-8/2022	2	50527	HAILAR	China		NCEI working to get BUFR Messages integrated into IGRA.
10/2021-Present	2	51709	KASHI	China		NCEI working to get BUFR Messages integrated into IGRA.
10/2021-Present	2	52681	MINQIN	China		NCEI working to get BUFR Messages integrated into IGRA.
10/2021-Present	2	53068	ERENHOT	China		NCEI working to get BUFR Messages integrated into IGRA.
10/2021-Present	2	55299	NAGQU	China		NCEI working to get BUFR Messages integrated into IGRA.
10/2021-Present	2	56778	KUNMING	China		NCEI working to get BUFR Messages

						integrated into IGRA.
10/2021-Present	2	57461	YICHANG	China		NCEI working to get BUFR Messages integrated into IGRA.
6/2021-1/2022	1	61052	NIAMEY-AERO	Niger	Yes	No reply received to date from GCOS Focal Point.
6/2022-Present	1	61660	DAKAR-DIASS-AIBD	Senegal		No reply received to date from GCOS Focal Point.
11/2019-Present	1	61980	SAINT-DENIS/GILLOT	Reunion	Yes	NCEI working to get BUFR Messages integrated into IGRA.
12/2018-Present	1	61998	KERGUELEN ISLANDS		Yes	NCEI working to get BUFR Messages integrated into IGRA.
6/2014-Present	1	62721	KHARTOUM	Sudan	Yes	Equipment Issues.
11/2021-Present	1	63450	ADDIS ABABA-BOLE	Ethiopia		No reply received to date from GCOS Focal Point.
6/2022	1	63741	DAGORETTI CORNER	Kenya		Equipment Issues.
11/2022-Present	1	63894	DAR ES SALAAM	Tanzania		No reply received to date from GCOS Focal Point.
7/2022-8/2022	1	64910	DOUALA	Cameroon		PILOT Observations
1/2022-2/2022	1	67083	ANTANANARIVO/IVATO	Madagascar		No reply received to date from GCOS Focal Point.
3/2018-Present	1	67774	HARARE	ZIMBABWE	Yes	No reply received to date from GCOS Focal Point.
7/2021-2/2022	1	68110	WINDHOEK	Namibia	Yes	Equipment Issues.
12/1/2022-Present	1	68906	GOUGH ISLAND	Ascension Island		No reply received to date from GCOS Focal Point.
6/2020-Present	1	68994	MARION ISLAND	SOUTH AFR	Yes	Equipment Issues.
1/2022	4	78583	BELIZE/PHILLIP GOLDSTON INTL.	Belize		No reply received to date from GCOS Focal Point.
7/2021-Present	4	78762	JUAN SANTAMARIA INT. AIRPORT	Costa Rica	Yes	No reply received to date from GCOS Focal Point.
11/2022-Present	4	78954	GRANTLY ADAMS IAP	Barbados		Equipment Issues.
2/2022-8/2022	4	78988	HATO AIRPORT	Curacao		No reply received to date from GCOS Focal Point.
1/2022-2/2022	4	80001	CYPRUS	Colombia		No reply received to date from GCOS Focal Point.

11/2019-Present	3	81405	CAYENNE MATOURY	French Guiana	Yes	NCEI working to get BUFR Messages integrated into IGRA.
8/2019-Present	3	82397	FORTALEZA	Brazil	Yes	Communications Issues.
3/2019-Present	3	84008	SAN CRISTOBAL	Ecuador	Yes	No reply received to date from GCOS Focal Point.
2/2021-Present	3	84628	LIMA-CALLAO/CHAVEZ, PERU	Peru	Yes	Equipment Issues.
3/2022-8/2022	3	85469	ISLA DE PASCUA	Chile		No reply received to date from GCOS Focal Point.
5/2022-Present	on	87576	EZEIZA AERO	Argentina		Communications Issues.
4/2022	3	87860	COMODORO RIVADAVIA AERO	Argentina		Communications Issues.
3/2022-10/2022	7	89022	HALLEY	Antarctica		Annual Outage due to staffing.
9/2013-Present	5	91517	HONIARA	Solomon Islands	Yes	Communications Issues and lack of support.
5/2016-Present	5	91557	BAUERFIELD	Vanuatu	Yes	Communications Issues and lack of support.
11/2019-Present	5	91592	NOUMEA (NLE-CALEDONIE)	New Caledonia	Yes	NCEI working to get BUFR Messages integrated into IGRA.
1/2017-Present	5	91843	RAROTONGA	Cook Islands	Yes	Equipment Issues.
9/2021-Present	5	91925	HIVA-OA	French Polynesia		NCEI working to get BUFR Messages integrated into IGRA.
11/2019-Present	5	91938	TAHITI-FAAA	French Polynesia	Yes	NCEI working to get BUFR Messages integrated into IGRA.
11/2022-Present	5	91958	RAPA	French Polynesia		Communications Issues.
9/2013-Present	5	92035	POINT MORESBY	Papua New Guinea	Yes	Communications Issues and lack of support.
7/2022-Present	5	93112	WHENUAPAI	New Zealand		No reply received to date from GCOS Focal Point.
10/2022	5	93417	PARAPARAUMU AERODROME	New Zealand		No reply received to date from GCOS Focal Point.
4/2020-Present	5	93997	RAOUL/KERMADEC IS	New Zealand	Yes	Staffing issues and COVID-19 Impacts.
8/2022-Present	5	96315	BRUNEI AP	Borneo		PILOT Observations
10/2020-Present	6	01001	JAN MAYEN	Jan Mayen	Yes	NCEI working to get BUFR Messages integrated into IGRA.

9/2019- Present	6	06610	PAYERNE	Switzerland	Yes	NCEI working to get BUFR Messages integrated into IGRA.
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